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September 7, 2012

Representative Dan Lundgren, Chairman

Representative Yvette Clarke, Ranking Minority Member

Subcommittee on Cybersecurity, Infrastructure Protection, and Security Technologies

House Committee on Homeland Security

H2-176 Ford House Office Building

Washington, DC 20515

Dear Chairman Lundgren and Ranking Minority Member Clarke

I am an individual citizen and federally licensed amateur and commercial radio operator. I have studied the Electromagnetic Pulse (EMP) threat for many years and have submitted formal documents to the Federal Communications Commission (FCC) on this subject.

I respectfully request you to place this Written Testimony into the public record for the September 12, 2012 Cybersecurity Subcommittee Hearings on 'The EMP Threat – Examining the Consequences'

Sincerely,

Nickolaus E. Leggett, N3NL

WRITTEN TESTIMONY OF

NICKOLAUS E. LEGGETT, N3NL

BEFORE THE SUBCOMMITTEE

ON

CYBERSECURITY, INFRASTRUCTURE PROTECTION, AND SECURITY TECHNOLOGIES

OF THE

HOUSE COMMITTEE ON HOMELAND SECURITY

HEARINGS ON

"The EMP Threat – Examining the Consequences"

September 12, 2012

My name is Nickolaus E. Leggett (leggett3@gmail.com). I am an analyst, amateur radio operator, commercial radio operator and an inventor who is resident in Reston, Virginia. I have been a federally licensed amateur radio operator since the 1960s. My amateur radio call sign is N3NL. I am a credentialed electronics technician (ISCET and iNARTE) and I am an inventor with three United States Patents - U.S. Patents 3,280,929 3,280,930 6,771,935.

EXECUTIVE SUMMARY

My testimony discusses the need to develop protections from the effects of electromagnetic pulse (EMP) and solar geomagnetic storms. The first step is to get governmental agencies to hold public hearings on EMP and suitable protections.

THE NATURE OF ELECTROMAGNETIC PULSE (EMP)

Electromagnetic pulse (EMP) is a serious threat to the continued existence of the United States as a major military, economic, and social power. Indeed, EMP is a major threat to the continued existence of the United States in any form.

High-altitude Electromagnetic Pulse (HEMP) is the generation of a very intense pulse of radio waves using a nuclear weapon or device exploded in space near the Earth. The radiation from the nuclear bomb excites and agitates the Earth's ionosphere which generates a large zone of intense radio waves that can disable electronic equipment and communications equipment throughout the Nation. Several years ago, the Congress commissioned a detailed study of EMP that can be accessed online. Refer to Note One at the end of this document.

CONSEQUENCES OF ELECTROMAGNETIC PULSE ATTACKS

A HEMP attack consisting of a single high-yield nuclear weapon exploded a couple of hundred miles above the United States would disable electronics and communications through most of the Nation. Most of our nation's electronic infrastructure uses solid-state electronics and microprocessors that are quite vulnerable to electromagnetic pulse.

The failure of much of our electronics infrastructure would cause serious problems in supplying food, water, electric power, and communications to our population. In addition, the functions of business, government, and law enforcement would be greatly impaired. Panic, rioting, and the failure of law and order would probably occur.

LACK OF ACTION BY THE FEDERAL COMMUNICATIONS COMMISSION

I have devoted many years of my life to bringing the EMP threat to the attention of the Federal Communications Commission (FCC). Donald J. Schellhardt and I have submitted two formal petitions to the FCC calling for a Notice of Inquiry (NOI) and a Notice of Proposed Rule Making (NPRM) on EMP. Refer to Note 4. In addition, we have filed other formal comments with the Commission on this subject. The FCC has declined to take any positive action on EMP.

I am rather puzzled that the FCC refuses to act to protect our communications infrastructure from EMP. The subject is certainly interesting and it would be desirable to avoid the great damage that would result from any EMP attack. There is ample evidence

that EMP is a real and serious threat to the Nation. Certainly, if an EMP attack did occur, the Nation would not be friendly towards the decision makers who refused to protect against EMP attacks and their consequences.

HOSTILE NATIONS

We can all easily imagine several nations that would be quite happy if the United States were to collapse in response to an EMP attack. In their view, EMP would be a rather convenient method for deleting a major competitor. While launching a missile with a warhead from a ship is not an easy task, it is certainly easier than other methods of eliminating the United States. Also, the structure of the United States may become so shattered by an attack that other nations could actually colonize parts of the former United States.

PROPOSED CONGRESSIONAL ACTIONS

The Congress should request or require the FCC to hold rulemaking hearings on electromagnetic pulse and effective methods to protect communications equipment from it. Probably some form of shielding should be required to protect critical communications equipment. Similarly, Congress could require the Federal Energy Regulatory Commission (FERC) to hold hearings on protecting the electric power industry and other energy industries from EMP effects. Similarly, the Federal Aviation Administration (FAA) should have hearings on EMP impacts on air navigation technology and on the operation of aircraft engines.

Also, the Congress can consider legislation that would require that critical infrastructure be shielded against EMP. In developing this legislation, the Congress can

consult with the International Electrotechnical Commission (IEC) that has developed detailed standards on protection of infrastructure from EMP.

SOLAR GEOMAGNETIC STORMS

Congress also needs to examine the related natural phenomenon of solar geomagnetic storms. This natural phenomenon has a different physics from EMP but it is related. An intense solar storm can have a similar comprehensive effect that would result in the failure of the electric energy grid and other aspects of the infrastructure. Refer to Note 2. Federal agencies should be required to have hearings on solar geomagnetic storms.

AMATEUR RADIO

Amateur radio can perform local and long-distance communications during and after these chaotic events. Congress should establish legislation that would allow amateur radio operators to establish minimum-sized amateur radio antennas despite opposition of homeowner associations, condominium managements, and rental landlords.

OUR DUTY

It is in the Nation's interest that we all work to develop and apply effective protections against EMP attacks. Mr. Schellhardt and I have spent many years on this subject. Now Congress needs to move ahead constructively and deal with EMP threats.

Respectfully submitted,

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September 7, 2012

Appendix A – References on Solar Geomagnetic Storms and Electromagnetic Pulse

Note 1

The text of the Congressional Commission to Assess the Threat to the United States from Electromagnetic Pulse (EMP) Attack is available at the web site:

www.empcommission.org

This document confirms the serious impact of an EMP attack on the infrastructure of the United States.

Note 2

Severe Space Weather Events – Understanding Societal and Economic Impacts

A Workshop Report

National Academy of Sciences

National Academies Press

Publication Year 2008

PAPERBACK

ISBN-10:0-309-12769-6

ISBN-13:978-0-309-12769-1

This document can be accessed online at the URL:

http://www.nap.edu/catalog.php?record_id=12507

Note 3

H. Robert Schroeder, "Electromagnetic Pulse and Its Implications for EmComm", QST magazine, November 2009, pages 38 through 41. [The term EmComm refers to emergency communication.]

Note 4

Petitions to the Federal Communications Commission by Donald J. Schellhardt and Nickolaus E. Leggett

Docket RM-5528, Request to Consider Requirements for Shielding and Bypassing Civilian Communications Systems from Electromagnetic Pulse (EMP) Effects.

Docket RM-10330, Amendment of the Commission's Rules to Shield Electronics Equipment Against Acts of War Or Terrorism Involving Hostile Use of Electromagnetic Pulse (EMP).

Note 5

Daniel N. Baker and James L. Green, "The Perfect Solar Superstorm", Sky & Telescope, February 2011, Vol. 121 No. 2, Pages 28 – 34

Note 6

Publications Dealing with the Protection of Civil Equipment and Systems

from the Effects of HEMP and HPEM – Issued by the

International Electrotechnical Commission (IEC) SC 77C

Note 7

Mark Clayton, "Is US Ready for a 'Solar Tsunami'? "The Christian Science Monitor, June 27, 2011, Page 20

Note 8

H.R. 668, Secure High-voltage Infrastructure for Electricity from Lethal Damage Act (SHIELD Act) This bill was introduced on February 11, 2011. This bill addresses the subjects of solar geomagnetic storms and electromagnetic pulse (EMP) impacting the electric power industry.